

Green Buildings at Sandia

Sandia National Laboratories/New Mexico (Sandia) has responsibility for over 700 buildings, constituting over 6.5 million square feet of floor space. Sandia uses sustainable design principles and building practices that have been applied to new construction projects, existing building renovation or remodeling projects, as well as to the operating and maintenance practices for existing buildings.

Green Building at Sandia

Sandia is a member of the U.S. Green Building Council (USGBC), which is dedicated to promoting buildings that are environmentally responsible, profitable and healthy places to live and work. The USGBC developed the LEED (Leadership in Energy and Environmental Design) Green Building Rating System® as a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. Sandia currently has five LEED Certified buildings onsite; more than any other organization in the State of New Mexico. Below are the descriptions of Sandia's Green Buildings.

JCEL – LEED Certified – 60,000 GSF

The Joint Computational Engineering Laboratory (JCEL) is a 60,000 SF office/computational facility within Technical Area I at Sandia National Laboratories, New Mexico (SNL/NM) designed to accommodate top secret work. From the beginning, the building was conceived to be much more than a simple structure that houses SNL/NM scientists and engineers.



JCEL - the first LEED certified building at Sandia

The completion of JCEL is a significant achievement for SNL/NM in the area of sustainable design for the following reasons:

- JCEL is the first LEED building at SNL/NM and one of only a few within the DOE community.

- JCEL is the second LEED building in the state of New Mexico and the first LEED silver building in the state.
- JCEL is the first building at SNL/NM to fully include sustainable design in its scope from the beginning. The process used for JCEL has since been used to incorporate sustainable design into four additional buildings at SNL/NM.

CINT – LEED Certified – 97,000 GSF

Sandia Center for Integrated Nanotechnologies (CINT) is designed as an unprecedented synthesis of advanced research laboratories, adaptive workspace and vernacular architecture. Designed by HDR Architecture Inc., this 97,000 square-foot facility houses both labs and office space for some of the world's most advanced research in nanotechnology.

The Sandia CINT was designed with sustainable design, construction, and operation as a requirement. Using the LEED as a central design guide this sustainable facility maximizes site potential, water use and preservation, energy conservation and appropriate energy supply, building materials selection, and indoor environmental quality.

MESA MicroFab – LEED Certified – 97,050 GSF

The newly completed three-story MESA Microsystems Fabrication (MicroFab) facility was recently certified under the Leadership in Energy and Environmental Design (LEED™) Green Building Rating System developed by the U.S. Green Building Council (USGBC). LEED certification is granted only to those building projects demonstrating superior performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality. Currently, there are approximately 1,000 LEED certified buildings worldwide with another 8,000 building projects seeking LEED certification. The MicroFab facility is the first microchip fabrication facility to obtain this prestigious certification.

The MicroFab facility is one of the most modern and complex buildings at Sandia and is the first of three new facilities that make up the Microsystems and Engineering Sciences Applications (MESA) complex. Its structure includes sophisticated safety systems and controls because of the hazardous materials used in the production of compound semiconductors. The MicroFab provides cleanrooms and transition cleanroom space; support labs; chemical and specialty



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gas rooms; and service yard. A single-story office space for the cleanroom technicians is included with the MicroFab, which provides a physical connection to the new MESA Microsystems Laboratory (MicroLab) facility.

WIF – LEED Certified – 124,400 GSF + 35,400 GSF

Weapons Integration Facility – Classified (WIF-C) - This three-story portion of the WIF facility will house Weapons, C&ES, and Microsystems staff and is located within Tech Area I. WIF-C will facilitate design, system integration, and qualification of weapons systems.

- 274 personnel
- 124,400 GSF
- Visual Interactive Environment for Weapons Simulation (VIEWS) Corridor
- Visualization laboratory, primarily electrical and laser light laboratories.

Weapons Integration Facility – Unclassified (WIF-U) - This two-story portion of the WIF facility will house C&ES staff and MESA partners and will enable collaboration and proximity between partners from industry and academia and SNL scientists and engineers. WIF-U is located outside Tech Area I. Workspaces will encourage interaction and provide the environment necessary for process development and two-way information transfer.

- 100 personnel
- 35,400 GSF
- Advanced scientific visualization laboratory
- Pedestrian mall; parking lot; landscaping
- CUB-2 (expansion of CUB-2 as built for JCEL)

MLAB – LEED Certified – 128,185 GSF

Microsystems and Engineering Sciences Applications (MESA) facilities complex at Sandia National Laboratories, is dedicated to advancement in integrated Micro Electro Mechanical Systems (MEMS), the buildings were planned to be the cornerstone of a campus-style technical area. The MESA complex of four new buildings included approximately 377,000 square feet on a 30-acre site, dedicated to the design, analysis, prototyping, development and qualification of MEMS components. These Microsystems may ultimately combine sensing, data processing, data storage, mechanical actuation/manipulation, and communications with the external world, in a single integrated package.

The Microsystems Laboratory (MicroLab or MLAB), is one of the buildings in the MESA complex dedicated to light labs for chemical, electrical and laser work. The building is 128,185 square feet, and can accommodate 274 people. The lab provides facilities for research and development of MEMS components, rapid prototyping and testing of the integrated systems.

Some of the LEED project highlights consist of water harvesting, surface drainage, and a French drain to catch the building storm water. Bio-swailes were also utilized between sections of the parking lots.

The plan maximized day lighting into occupied spaces by placing the light sensitive labs, that due to owner requirements were not allowed to contain natural light, on the interior of the building with tow main corridors on both north and south sides. Along the corridor all offices have window that provide day lighting from the skylights above. On the south elevation a sunscreen was used to provide shading along all the offices.

The building is mostly constructed of a cast-in place concrete frame to accommodate strict vibration criteria in the laboratories and seismic conditions in the region, in the main corridors and public area the concrete columns and shear walls were left exposed to limit the construction material as well as express the structure. Structural steel was used to construct the penthouses and visualization laboratory. The main exterior is clad in a mixture of architectural pre-cast concrete panels, composite stone panels and composite aluminum panels.

Sandia's most recent sustainable design efforts include incorporation of sustainability into the Long Range Development Plan (LRDP) and the Ten Year Site Plan (TYSP). In 2008 Sandia began a major effort, described in the FY 2008 Sustainable Design Implementation Plan, to prioritize all of its buildings to identify LEED certification opportunities for renovations and existing buildings. The goal is to register one or two buildings this year under the LEED-Existing Building rating system.

For more information on sustainable design and green building practices at Sandia, contact Jack Mizner at jhmizne@sandia.gov.

